

1. An improved electrode assembly for use inside a battery having case with electrolyte therein, comprising:

a plurality of electrodes arranged in a stacked relationship;

said plurality of electrodes including at least one positive electrode, said positive electrode having a positive active surface area communicating with a positive conducting edge portion;

said plurality of electrodes including at least one negative electrode, said negative electrode having a negative active surface area communicating with a negative conducting edge portion;

each said positive conducting edge forming a positive current collector along substantially one entire edge of said positive electrodes;

each said negative conducting edge forming a negative current collector along substantially one entire edge of each of said negative electrodes;

a porous separator disposed between said positive active surface area of each of said positive electrodes and said negative active surface area of each of said negative electrodes; and

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means communicate electric current to a device exterior to said battery from said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode.

2. The improved electrode assembly as defined in claim 1 wherein said positive surface and said negative surface overlap, said overlap defining a reaction plane; and

the sum of the distance to said positive conducting edge and the distance to said negative conducting edge, from any point on said reaction plane is substantially equal.

3. The improved electrode assembly as defined in claim 1 wherein each electrode in said plurality of electrodes is formed of electrically conductive substrate having electrolytically active material located on said electrically conductive substrate;

the area of said electrolytically active material located on said electrically conductive substrate forming said positive electrode defining said positive active surface area;

said positive conducting edge portion of said positive electrode being the area of said electrically conductive substrate adjacent to said positive active surface area; and

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the area of said electrolytically active material located on said electrically conductive substrate forming said negative electrode defining said negative active surface area; and

said negative conducting edge portion being the area of said electrically conductive substrate forming said negative electrode adjacent to said negative active surface area.

4. The improved electrode assembly as defined in claim 1 wherein said positive conducting edge portion, of each of said positive electrodes are stacked adjacent to each other;

said positive conducting edge portion, of each of said positive electrodes are stacked adjacent to each other in substantial alignment with each other thereby forming a positive edge portion;

said negative conducting edge portion, of each of said negative electrodes are stacked adjacent to each other in substantial alignment with each other thereby forming a negative edge portion; and

said positive end portion being located on an opposite side of said electrode assembly from said negative edge portion.

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5. The improved electrode assembly as defined in claim 2 wherein said positive conducting edge portion, of each of said positive electrodes are stacked adjacent to each other;

said positive conducting edge portion, of each of said positive electrodes are stacked adjacent to each other in substantial alignment with each other thereby forming a positive edge portion;

said negative conducting edge portion, of each of said negative electrodes are stacked adjacent to each other in substantial alignment with each other thereby forming a negative edge portion; and

said positive end portion being located on an opposite side of said electrode assembly from said negative edge portion.

6. The improved electrode assembly as defined in claim 1 wherein said plurality of electrodes are stacked with said positive active surface area of said positive electrode offset from said negative conducting edge portion of said negative electrode and said negative active surface area of said negative electrode are offset from said positive conductive edge portion of said positive electrode.

7. The improved electrode assembly as defined in claim 5 wherein said plurality of electrodes are stacked with said positive active surface area of said positive electrode offset from said negative conducting edge portion of said negative electrode and said negative active surface area of said negative electrode are offset from said positive conductive edge portion of said positive electrode.

8. The improved electrode assembly as defined in claim 6 wherein said positive active surface area of said at least one positive electrode is smaller than the dimensions of said negative active surface area of said at least one negative electrode.

9. The improved electrode assembly as defined in claim 7 wherein said positive active surface area of said at least one positive electrode is smaller than the dimensions of said negative active surface area of said at least one negative electrode.

10. The improved electrode assembly as defined in claim 1 wherein said positive conducting edge portion and said negative conducting edge portion are positioned on adjacent sides of said electrode assembly formed by said plurality of electrodes arranged in said stacked relationship.

11. The improved electrode assembly as defined in claim 1 wherein said electrical conductors coupled to said positive conducting edge portion of said positive electrode and to said negative conducting edge portion of said negative electrode secure said plurality of electrodes in said stacked relationship.

12. The improved electrode assembly as defined in claim 1 wherein said means communicate electric current to a device exterior to said battery from said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode comprise conductors elongated to extend substantially the entire length of said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode respectively, each of said conductors communicating with a terminal on the exterior of the battery.

13. The improved electrode assembly as defined in claim 2 wherein said means communicate electric current to a device exterior to said battery from said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode comprise conductors elongated to extend substantially the entire length of said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode respectively, each of said conductors communicating with a terminal on the exterior of the battery.

14. The improved electrode assembly as defined in claim 12 wherein said conductors have a bulk resistivity less than $10e-6$ ohm-cm.

15. The improved electrode assembly as defined in claim 13 wherein said conductors have a bulk resistivity less than $10e-6$ ohm-cm.

16. The improved electrode assembly as defined in claim 12 wherein said conductor is copper.

17. The improved electrode assembly as defined in claim 13 wherein said conductor is copper.

18. The improved electrode assembly as defined in claim 16 wherein said conductor is nickel plated.

19. The improved electrode assembly as defined in claim 17 wherein said conductor is nickel plated.

20. An improved electrode assembly for use in battery comprising:

a plurality of electrodes arranged in a rolled relationship; said plurality of electrodes including at least one positive electrode, said positive electrode having a positive active surface area communicating with a positive conducting edge portion;

said plurality of electrodes including at least one negative electrode, said negative electrode having a negative active surface area communicating with a negative conducting edge portion;

each said positive conducting edge forming a positive current collector along substantially one entire edge of said positive electrodes;

each said negative conducting edge forming a negative current collector along substantially one entire edge of each of said negative electrodes;

a porous separator disposed between said positive active surface area of each of said positive electrodes and said negative active surface area of each of said negative electrodes; and

means communicate electric current exterior to said battery from said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode.

21. An improved electrode assembly for use in battery of claim 20 wherein said plurality of electrodes are arranged in said rolled relationship around a mandrel.

22. The improved electrode assembly as defined in claim 20 wherein the sum of the distance to said positive conducting edge and the distance to said negative conducting edge, from any point on said positive surface area is substantially equal; and

the sum of the distance to said positive conducting edge and said negative conducting edge, from any point on said negative surface area is substantially equal.

23. The improved electrode assembly as defined in claim 21 wherein the sum of the distance to said positive conducting edge and the distance to said negative conducting edge, from any point on said positive surface area is substantially equal; and

the sum of the distance to said positive conducting edge and said negative conducting edge, from any point on said negative surface area is substantially equal.

24. The improved electrode assembly as defined in claim 20 wherein said means communicate electric current exterior to said battery from said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode comprise conductors elongated to extend substantially the entire length of said positive conducting edge portion of said positive electrode and said negative conducting edge portion of said negative electrode respectively, when in said rolled relationship, each of said conductors communicating with a terminal on the exterior of the battery.

25. The improved electrode assembly as defined in claim 24 wherein said conductors have a bulk resistivity less than $10e-6$ ohm-cm.

26. The improved electrode assembly as defined in claim 25 wherein said conductor is copper.

27. The improved electrode assembly as defined in claim 25 wherein said conductor is nickel plated.

28. The improved electrode assembly as defined in claim 24 wherein said electrical conductors each have at a plurality of said terminals communicating therewith along side edges of said electrode assembly.

29. The improved electrode assembly as defined in claim 12 additionally comprising means for pressured engagement of the positive conducting edge to said conductor extending substantially the entire length of said positive conducting edge; and

means for pressured engagement of said negative conducting edge to said conductor extending substantially the entire length of said negative conducting edge.

30. The improved electrode assembly as defined in claim 13 additionally comprising:

means for pressured engagement of the positive conducting edge to said conductor extending substantially the entire length of said positive conducting edge; and

means for pressured engagement of said negative conducting edge to said conductor extending substantially the entire length of said negative conducting edge.

31. The improved electrode assembly described in claim 1, wherein the resistance generated by the distance between the positive and negative current collectors can be reduced to satisfy any desired low level of required resistance of the electrode stack.